

What is Claimed:

1. A granule comprising a protein core comprising a protein matrix, ^{wherein} ~~herein~~
the protein matrix comprises a protein mixed together with a combination of a sugar
5 and a structuring agent.
2. The granule of claim 1, wherein the structuring agent is selected from the
group consisting of a polysaccharide and a polypeptide.
- 10 3. The granule of claim 2, wherein the structuring agent is selected from the
group consisting of starch, modified starch, cellulose, modified cellulose,
carrageenan, gum arabic, acacia gum, xanthan gum, locust bean gum, and guar
gum.
- 15 4. The granule of claim 2, wherein the structuring agent is selected from the
group consisting of chitosan, gelatin, casein, collagen, polyaspartic acid and
polyglutamic acid.
- 20 5. The granule of claim 1, wherein the sugar is selected from the group
consisting of glucose, fructose, raffinose, maltose, lactose, trehalose and sucrose.
- 25 6. The granule of claim 1, further comprising a synthetic polymer, wherein
the synthetic polymer is selected from the group consisting of polyethylene oxide,
polyvinyl alcohol, polyvinyl pyrrolidone, polyethylene glycol and polyethylene
oxide/polypropylene oxide.
7. The granule of claim 1, wherein the protein core comprises the protein
matrix layered over a seed particle.
- 30 8. The granule of claim 1 further comprising a coating layer.

9. The granule of claim 8 wherein the coating layer is over the seed particle.

10. The granule of claim 8, wherein the coating layer is over the protein matrix.

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11. The granule of claim 8, wherein the coating is selected from the group consisting of polyvinyl alcohol, polyvinyl pyrrolidone, cellulose derivatives such as methylcellulose, hydroxypropyl methylcellulose, hydroxycellulose, ethylcellulose, carboxymethyl cellulose, hydroxypropyl cellulose, polyethylene glycol, polyethylene oxide, chitosan, gum arabic, xanthan and carrageenan.

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12. A granule comprising a protein core comprising a protein matrix, wherein the protein matrix comprises a protein mixed together with a combination of a sugar alcohol and a structuring agent.

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13. The granule of claim 12, wherein the structuring agent is selected from the group consisting of a polysaccharide and a polypeptide.

14. The granule of claim 13, wherein the structuring agent is selected from the group consisting of starch, modified starch, carrageenan, cellulose, modified cellulose, gum arabic, acacia gum, xanthan gum, locust bean gum, and guar gum.

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15. The granule of claim 13, wherein the structuring agent is selected from the group consisting of chitosan, gelatin, casein, collagen, polyaspartic acid and polyglutamic acid.

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16. The granule of claim 12, wherein the sugar alcohol is selected from the group consisting of mannitol, sorbitol and inositol.

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17. The granule of claim 12, further comprising a synthetic polymer, wherein the synthetic polymer is selected from the group consisting of polyethylene oxide,

polyvinyl alcohol, polyvinyl pyrrolidone, polyethylene glycol and polyethylene oxide/polypropylene oxide.

18. The granule of claim 12, wherein the protein core comprises the protein
5 matrix layered over a seed particle.

19. The granule of claim 12 further comprising a coating layer.

20. The granule of claim 19 wherein the coating layer is over the seed
10 particle.

21. The granule of claim 19, wherein the coating layer is over the protein
matrix.

22. The granule of claim 19, wherein the coating is selected from the group
15 consisting of polyvinyl alcohol, polyvinyl pyrrolidone, cellulose derivatives such as
methylcellulose, hydroxypropyl methylcellulose, hydroxycellulose, ethylcellulose,
carboxymethyl cellulose, hydroxypropyl cellulose, polyethylene glycol, polyethylene
oxide, chitosan, gum arabic, xanthan and carrageenan.

23. A granule comprising an enzyme core comprising an enzyme matrix,
20 wherein the enzyme matrix comprises an enzyme mixed together with a combination
of a sugar and a structuring agent.

24. The granule of claim 23, wherein the structuring agent is selected from
25 the group consisting of a polysaccharide and a polypeptide.

25. The granule of claim 24, wherein the structuring agent is selected from
30 the group consisting of starch, modified starch, carrageenan, cellulose, modified
cellulose, gum arabic, acacia gum, xanthan gum, locust bean gum, and guar gum.

26. The granule of claim 24, wherein the structuring agent is selected from the group consisting of chitosan, gelatin, casein, collagen, polyaspartic acid and polyglutamic acid.

5 27. The granule of claim 23, wherein the sugar is selected from the group consisting of glucose, fructose, raffinose, maltose, lactose, trehalose and sucrose.

10 28. The granule of claim 23, further comprising a synthetic polymer, wherein the synthetic polymer is selected from the group consisting of polyethylene oxide, polyvinyl alcohol, polyvinyl pyrrolidone, polyethylene glycol and polyethylene oxide/polypropylene oxide.

15 29. The granule of claim 23, wherein the protein core comprises the enzyme matrix layered over a seed particle.

30. The granule of claim 23 further comprising a coating layer.

20 31. The granule of claim 30 wherein the coating layer is over the seed particle.

32. The granule of claim 30, wherein the coating layer is over the enzyme matrix.

25 33. The granule of claim 30, wherein the coating is selected from the group consisting of polyvinyl alcohol, polyvinyl pyrrolidone, cellulose derivatives such as methylcellulose, hydroxypropyl methylcellulose, hydroxycellulose, ethylcellulose, carboxymethyl cellulose, hydroxypropyl cellulose, polyethylene glycol, polyethylene oxide, chitosan, gum arabic, xanthan and carrageenan.

30 34. A granule comprising an enzyme core comprising an enzyme matrix, wherein the enzyme matrix comprises an enzyme mixed together with a combination of a sugar alcohol and a structuring agent.

35. The granule of claim 34, wherein the structuring agent is selected from the group consisting of a polysaccharide and a polypeptide.

5 36. The granule of claim 35, wherein the structuring agent is selected from the group consisting of starch, modified starch, carrageenan, cellulose, modified cellulose, gum arabic, acacia gum, xanthan gum, locust bean gum, and guar gum.

10 37. The granule of claim 35, wherein the structuring agent is selected from the group consisting of chitosan, gelatin, casein, collagen, polyaspartic acid and polyglutamic acid.

15 38. The granule of claim 34, wherein the sugar alcohol is selected from the group consisting of mannitol, sorbitol and inositol.

20 39. The granule of claim 33, further comprising a synthetic polymer, wherein the synthetic polymer is selected from the group consisting of polyethylene oxide, polyvinyl alcohol, polyvinyl pyrrolidone, polyethylene glycol and polyethylene oxide/polypropylene oxide.

40 40. The granule of claim 33, wherein the protein core comprises the enzyme matrix layered over a seed particle.

25 41. The granule of claim 33 further comprising a coating layer.

42. The granule of claim 41 wherein the coating layer is over the seed particle.

30 43. The granule of claim 41, wherein the coating layer is over the enzyme matrix.

44. The granule of claim 41, wherein the coating is selected from the group consisting of polyvinyl alcohol, polyvinyl pyrrolidone, cellulose derivatives such as methylcellulose, hydroxypropyl methylcellulose, hydroxycellulose, ethylcellulose, carboxymethyl cellulose, hydroxypropyl cellulose, polyethylene glycol, polyethylene oxide, chitosan, gum arabic, xanthan and carrageenan.

45. A method for making a granule, said method comprising:
a) providing a seed particle; and
b) coating the seed particle of step a) with a protein matrix comprising a protein mixed together with a sugar or sugar alcohol and a structuring agent.

46. The method of claim 45 further comprising applying a barrier material.

47. The method of claim 45 further comprising applying a coating layer.

48. The method of claim 47, wherein the coating layer is applied over the seed particle.

49. The method of claim 47, wherein the coating layer is applied over the protein matrix.

50. The method of claim 47 wherein the coating is selected from the group consisting of polyvinyl alcohol, polyvinyl pyrrolidone, cellulose derivatives such as methylcellulose, hydroxypropyl methylcellulose, hydroxycellulose, ethylcellulose, polyethylene glycol, polyethylene oxide, chitosan, gum arabic, xanthan and carrageenan.

51. A method for making a granule, said method comprising:
a) providing a homogenous protein matrix core comprising a protein mixed together with a sugar or sugar alcohol and a structuring agent.

52. The method of claim 51 further comprising applying a barrier material.

53. The method of claim 51 further comprising applying a coating layer.

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54. The method of claim 53, wherein the coating layer is applied over the barrier material.

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55. The method of claim 53, wherein the coating layer is applied over the protein matrix.

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56. The method of claim 53 wherein the coating is selected from the group consisting of polyvinyl alcohol, polyvinyl pyrrolidone, cellulose derivatives such as methylcellulose, hydroxypropyl methylcellulose, hydroxycellulose, ethylcellulose, polyethylene glycol, polyethylene oxide, chitosan, gum arabic, xanthan and carrageenan.

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